Figure 23.
Unidentified polychaetes.

Figure 24.
Unidentified polychaetes.

Figure 25.
Hemichordate.

Figure 26.
Dead organisms on the bottom in oxygen concentrations of < 0.5 mg/l.
Unidentified polychaete.

Figure 27.
Unidentified crab.

Figure 28.
Unidentified burrowing shrimp.

Presentation Discussion

Don Harper (Texas A&M University— Galveston, TX)

An unidentified woman from Texas stated that there was some evidence that the episodic quality of hypoxic waters in response to hurricanes passing to the east of the hypoxic area may cause deterioration of benthic organisms on the eastern coast of Texas. She asked Don Harper if he had found any further evidence of this effect, and referred to a quote he made in the *Houston Chronicle* as saying perhaps one of the fish kills in east Texas was associated with the 1983 phenomenon.

Don Harper said he had no evidence which supported that observation and felt that she had misinterpreted his statement. He clarified the *Houston Chronicle* quote by saying he was discussing a fairly localized dinoflagellate bloom and he was not aware of the effects it had on bottom waters.

Don Boesch *(University of Maryland— Cambridge, MD)* asked Don Harper if he understood the fate of mobile organisms such as shrimp in areas where the oxygen stress is not severe enough to cause complete mortality of benthic organisms.

Don Harper discussed a series of five summer cruises during which he and Nancy Rabalais used an ROV to generate many videos and slides. Because there was a sharp demarcation between the hypoxic and normoxic waters, they expected an abundance of fish and shrimp along the edge of the zone. Instead, the last segment on the video tape showed a bolus of hypoxic water in the middle of the water mass and a huge concentration of fish above the bolus.

He continued by discussing a cruise that he and Eugene Turner completed during which they crossed a boundary between hypoxic and normoxic waters. The water mass was being moved westward by water which was up welling from the deep-water area off the Mississippi Delta. Heading back toward Louisiana, there was a gradual transition from normoxic to hypoxic waters and no evidence of a strong concentration of fish or shrimp. He believed that this was a result of the shrimp traveling further up the water column, making them ideal prey for sight feeding predators.

He justified this theory by explaining that when bottom water begins to turn hypoxic it becomes very clear because the picnocline (boundary) prevents suspended material from breaking through. The suspended material already in the bottom water settles out, causing the water to become very clear. In these conditions, shrimp are easily seen by sight feeding predators.

Eugene Turner *(Louisiana State University— Baton Rouge, LA)* added that he had also witnessed this phenomenon. He has seen squid dive into the hypoxic layer to feed on shrimp.

Don Harper commented that the video tape depicting Nancy Rabalais' "D-transect" showed a concentration of fish in the upper portion and in the lower portion they were absent.

William Herke *(Citizens for a Clean Environment—Baton Rouge, LA)* commented that when the water oxygen is normal those types of organisms are found in the bottom of the water column. He asked Don Harper if these organisms were important as a base of the food chain for other commercially important organisms.

Don Harper replied that shrimp spend their time on the bottom when they are feeding and work

their appendages into the bottom looking for polychaetes and small crustaceans. Most of the organisms that were viewed in the video were too large to be prey for shrimp. However, benthic communities are extremely important in shrimp production.

Though he has not been able to establish a scientific correlation, the period of time when lowest benthic abundances were found was also the period of greatest shrimp landings in the Galveston region. Therefore, he theorized that the shrimp are feeding on a lot of the benthic organisms during that period. He intends to continue his efforts to demonstrate a correlation between the necessity of the benthic organisms to the overall health of the shrimp community.